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First Publication (A)

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SPECIFICATION

1. TITLE OF THE INVENTION

Make-up cosmetic

2. CLAIM

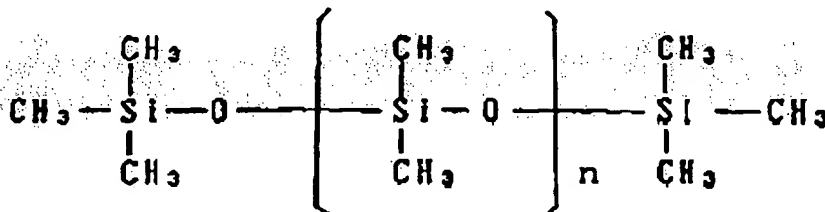
A make-up cosmetic characterized by comprising 1 to 70% by weight of an organic silicone resin shown by (A) described below, 10 to 98% by weight of a volatile silicone oil shown by (B) described below, and 0.5 to 55% by weight of powder:

(A) organic silicone resin comprising 70% by mol or greater of an  $R_3SiO_{1/2}$  unit and an  $SiO_2$  unit, in which the molar ratio

of the  $R_3SiO_{1/2}$  unit and the  $SiO_2$  unit is in a range of 0.5/1 to 1.5/1, and 1 to 30% by mol of an  $R_2SiO$  unit and/or an  $RSiO_{3/2}$  unit (wherein R represents a hydrocarbon group having 1 to 6 carbon atoms or a phenyl group); and

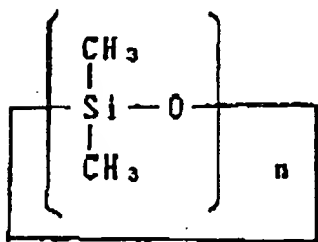
(B) at least one volatile silicone oil represented by General formula (I) and General formula (II):

General formula (I)



(in the formula, n represents an integer of 0 to 5)

General formula (II):



(in the formula, n represents an integer of 3 to 7).

### 3. DETAILED EXPLANATION OF THE INVENTION

[Industrial Field of Application]

The present invention relates to a make-up cosmetic, and more particularly, relates to a make-up cosmetic having good water resistance, perspiration resistance, and oil resistance, and exhibiting superior make-up durability and superior stability.

What is meant by the term "make-up cosmetic" in the present invention includes basecoats, as well as conventional make-up cosmetics.

[Prior Art]

There are various forms and kinds of make-up cosmetics such as solid foundations, solid eye shadows, oily foundations, and lipsticks, all of which comprise powders and oils. In addition, there are also emulsion-type foundations based on emulsion systems. All of these are characterized in that they include large amounts of inorganic powders such as talc, kaolin, iron oxide, titanium oxide, and titanium-mica pearlescent pigments, and large amounts of organic pigments such as nylon, cellulose, and tar pigments.

[Problems to be Solved by the Invention]

In such make-up cosmetics, make-up running such as gathering, running, or the like occurs, caused by sebum, perspiration, or other oily ingredients included in the cosmetics. In particular, an improvement has been desired against make-up running under the conditions of high temperature and high humidity during the summer, make-up running being a common problem for women.

Cosmetic basecoats are employed in order to improve the spreadability and finishing of make-up cosmetics. However, little attention has been given to the make-up durability of the make-up cosmetics.

The technique in which that a silicone resin is added to cosmetics in order to prevent make-up running is disclosed in Japanese Unexamined Patent Application, First Publication No. Sho 61 - 18708. The silicone resin described therein is prepared by, for example, subjecting an organic trichlorosilane and an organic dichlorosilane to hydrolysis, and subsequently subjecting the hydrolysates to condensation, followed by hardening with cross-linking. For this reason, the silicone resin having a small molecular weight exhibits high adhesiveness

and stickiness, and cannot exhibit effects in sufficiently preventing make-up running. On the other hand, if the polymerization degree of the silicone resin is increased until adhesiveness is not exhibited, forming a three-dimensional structure, in order to obtain the sufficient effects in preventing make-up running, it is difficult to dissolve the silicone resin in the other oily ingredients or silicone oils for use in cosmetics. As a result, such silicone resins have disadvantages in that they become unstable due to their insolubility or because a cross-linking polymerization occurs over time, and for these reasons, the stability of the products, particularly at high temperatures, becomes poor. In addition, in Japanese Patent Application No. Sho 59 - 187139, a silicone resin comprising a  $R_3SiO_{1/2}$  unit and a  $SiO_2$  unit is employed in make-up cosmetics. These make-up cosmetics have problems in that the silicone film formed on the skin is too hard after the make-up cosmetic is applied to the skin, and for this reason, cracking occurs over time and make-up durability is poor.

[Means for Solving the Problems]

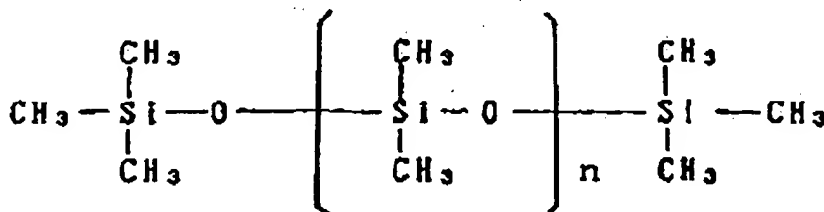
Considering these situations, the present inventors devoted diligent research to obtaining a make-up cosmetic which exhibits superior effects in preventing make-up running. As a result, they discovered that a make-up cosmetic exhibiting good spreadability, affording good refreshing feeling in use, and having superior effects in preventing make-up running can be obtained by employing a specific organic silicone resin together with a volatile silicone oil and by adding powder thereto, thus completing the present invention.

That is, the present invention corresponds to a make-up cosmetic characterized by comprising 1 to 70% by weight of an organic silicone resin shown by (A) described below, 10 to 98% by weight of a volatile silicone oil shown by (B) described below, and 0.5 to 55% by weight of powder:

(A) organic silicone resin comprising 70% by mol or greater of an  $R_3SiO_{1/2}$  unit and an  $SiO_2$  unit, in which the molar ratio of the  $R_3SiO_{1/2}$  unit and the  $SiO_2$  unit is in a range of 0.5/1 to 1.5/1, and 1 to 30% by mol of an  $R_2SiO$  unit and/or an  $RSiO_{3/2}$  unit (wherein R represents a hydrocarbon group having 1 to 6 carbon atoms or a phenyl group); and

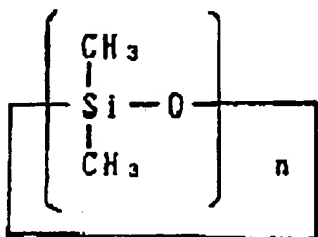
(B) at least one volatile silicone oil represented by General formula (I) and General formula (II):

General formula (I)



(in the formula, n represents an integer of 0 to 5)

General formula (II):



(in the formula, n represents an integer of 3 to 7).

The organic silicone resin of the (A) described above employed in the present invention can be easily produced by mixing the corresponding known silanes, diluting the mixture with a solvent such as toluene or hexane, subsequently subjecting it to hydrolysis, and subsequently polymerizing it under heating. If water glass is employed, other than the silanes, as the  $SiO_2$

unit, the same silicone resins as described above can be obtained.

In addition, any of the chain-like silicone oil and the cyclic silicone oil represented by General formulae (I) and (II) described above, respectively, which are employed in the present invention, are volatile. These oils can act as a solvent for dissolving the organic silicone resin described above.

In addition, the powder employed in the present invention may be any powder commonly used in make-up cosmetics. As examples of such powders, mention may be made of, for example, inorganic powders such as talc, mica, kaolin, calcium carbonate, zinc white, titanium dioxide, red iron oxide, yellow iron oxide, black iron oxide, ultramarine blue, Prussian blue, chromium hydroxide, bismuth oxychloride, and titanium-mica pearlescent pigments; organic powders such as red No. 201, red No. 202, yellow No. 5, aluminum lake, and blue No. 1 aluminum lake; resin powders such as nylon, cellulose, and polyethylene; various metal soaps; and the like.

The appropriate compositional ratio of each of the essential components is as follows.

The organic silicone resin is included in the range of 1 to 70% by weight in the total weight of the make-up cosmetic; the volatile silicone oil is included in the range of 10 to 98% by weight in the make-up cosmetic; and the powder is included in the range of 0.5 to 55% by weight in the total weight of the make-up cosmetic.

Obviously, water-in-oil type or oil-in-water type emulsified make-up cosmetics which retain the ability to prevent make-up running can be produced with the emulsion techniques in which water-soluble components and appropriate surfactants are employed in addition to the essential components described above.

In the make-up cosmetics of the present invention, in

addition to the components described above, fats and oils, waxes, pharmaceutical agents, fragrances, other volatile components, or the like may be further added within a quantitative or qualitative range that does not impair the effects of the present invention.

Hereinbelow, the present invention is explained in detail by means of Examples. The present invention is not limited by these Examples. All added amounts are given as % by weight.

Example 1: Oily foundation

(1) Kaolin	25.0%
(2) Titanium dioxide	15.0
(3) Iron oxide	3.0
(4) Microcrystalline wax	4.0
(5) Liquid paraffin	5.0
(6) Sorbitan sesquioleate	1.0
(7) Octamethylcyclotetrasiloxane	
(General formula (II), $n = 4$ )	remainder
(8) Organic silicone resin consisting of	
$(\text{CH}_3)_3\text{SiO}_{1/2} / \text{SiO}_2 / (\text{CH}_3)_2\text{SiO} = 2.4/1.6/1.0$	2.0
(9) Fragrance	appropriate amount

Components (4) to (8) were melted while stirring at 70 to 80°C, and subsequently, components (1) to (3) were added thereto to disperse them therein. After the dispersion was deaerated, component (9) was added thereto. The obtained mixture was filled in the prescribed container, thus producing an oily foundation.

The oily foundation according to Example 1 was a make-up cosmetic having superior moisture resistance, oil resistance, and perspiration resistance, and exhibiting little make-up running. In addition, the oily foundation afforded a refreshing

feeling in use. In addition, after this product was stored for one month at 50°C, it was stable without any agglutination, separation, and increased viscosity.

Comparative Example 1: Oily foundation

(1) Kaolin	25.0%
(2) Titanium dioxide	15.0
(3) Iron oxide	3.0
(4) Microcrystalline wax	4.0
(5) Liquid paraffin	5.0
(6) Sorbitan sesquioleate	1.0
(7) Ethyl hydroxyethylcellulose	10.0
(8) Ethanol	10.0
(9) Volatile isoparaffin	
(boiling point: 116 to 143°C)	remainder
(10) Fragrance	appropriate amount

Components (7) and (8) were melted while stirring at 70 to 80°C and were subsequently dispersed in component (9). Components (4) to (6) were added thereto and were melted while heating. Components (1) to (3) were added thereto and were uniformly dispersed therein. After the dispersion was deaerated, component (10) was added thereto and was stirred. The obtained mixture was filled in the prescribed container, thus producing an oily foundation.

Example 1 and Comparative Example 1 were subjected to the following evaluation.

Filter paper was impregnated with water or squalene. The sample of Example 1 or Comparative Example 1 was applied to a nylon plate and was subsequently dried. Pressure from the dried nylon plate was exerted on the filter paper 10 times with a vertical motion. After completion of this procedure, the



amount of the sample transferred from the nylon plate to the filter paper was determined by visual evaluation of the color density.

[Evaluation points]

- 1 No transference
- 2 Slight transference
- 3 Marked transference

The results which are shown in Table 1 are the mean values from five experimental measurements.

Table 1

	Water	Squalene
Example 1	1.0	1.0
Comparative Example 1	2.2	2.8

The results show that the make-up cosmetic obtained in Example 1 exhibits hardly any transferring property with respect to water or squalene, i.e., it is a make-up cosmetic exhibiting better water resistance and oil resistance and superior make-up durability, as compared to that of Comparative Example 1 which is a prior art make-up cosmetic with good make-up durability.

#### Example 2: Liquid lipstick

- |   |      |
|---|------|
| (1) Dimethylpolysiloxane 0.65 CS  | 20.0 |
| (General formula (I), $n = 0$ )   |      |
| (2) Dimethylpolysiloxane 2.0 CS   | 20.0 |
| (General formula (I), $n = 3$ )   |      |
| (3) Organic silicone resin consisting of  |      |
| $(\text{CH}_3)_3\text{SiO}_{1/2} / \text{SiO}_2 / (\text{CH}_3)_2\text{SiO} / (\text{C}_6\text{H}_5)\text{SiO}_{3/2} =$ |      |
| 1.6/3.1/1.0/1.0   | 40.0 |
| (4) Glyceryl triisostearate   | 10.0 |

(5) Red No. 226

10.0

(6) Fragrance

appropriate amount

Components (1) to (3) were melted while stirring at 70 to 80°C. In a separate operation, components (4) and (5) were treated with a roller and were subsequently added thereto to disperse them therein. After the dispersion was deaerated, component (6) was added thereto, thus producing a liquid lipstick.

The liquid lipstick according to Example 2 had superior moisture resistance, oil resistance, and perspiration resistance, and exhibited little make-up running caused by adhesion to cups and the like. In addition, the lipstick afforded a refreshing feeling in use. In addition, after this product was stored for one month at 50°C, it was stable without any agglutination, separation, and increased viscosity.

#### Example 3: Mascara

(1) Dimethylpolysiloxane 1.5 CS

4.5%

(General formula (I),  $n = 2$ )

(2) Octamethyl cyclotetrasiloxane

10.0

(General formula (II),  $n = 4$ )

(3) Organic silicone resin consisting of

$(\text{CH}_3)_3\text{SiO}_{1/2} / \text{SiO}_2 / (\text{CH}_3)\text{SiO}_{3/2} = 44/55/1$  70.0

(4) Black iron oxide

15.0

(5) POE (20) sorbitan monolaurate

0.5

(6) Fragrance

appropriate amount

Components (1) to (3) were melted while stirring at 70 to 80°C. Subsequently, components (4) and (5) were added thereto to disperse them therein. After the dispersion was deaerated, component (6) was added thereto, thus producing a mascara.

The mascara according to Example 3 exhibited little make-up running due to tears and the like, and did not adhere to the eyelids. In addition, after this product was stored for one month at 50°C, it was stable without any agglutination, separation, and increased viscosity.

Example 4: Cosmetic basecoat

(1) Kaolin	10.0%
(2) Titanium dioxide	5.0
(3) Red iron oxide	0.3
(4) Yellow iron oxide	0.2
(5) Methylphenylpolysiloxane (n = 100)	20.0
(6) Dimethylpolysiloxane 2 CS (General formula (I), n = 3)	10.0
(7) Solid paraffin	5.0
(8) Microcrystalline wax	4.0
(9) Sorbitan sesquioleate	1.0
(10) Organic silicone resin consisting of $(\text{CH}_3)_3\text{SiO}_{1/2} / \text{SiO}_2 / (\text{CH}_3)_2\text{SiO} / (\text{CH}_3)\text{SiO}_{3/2} =$ 15/15/2.5/1.0	2.0
(11) Decamethylcyclopentasiloxane (General formula (II), n = 5)	24.5
(12) Fragrance	appropriate amount

Components (1) to (4) were mixed and pulverized. In a separate operation, components (5) to (11) were mixed and melted at 70 to 80°C. These two mixtures were mixed while stirring, and were subsequently deaerated. Subsequently, component (12) was added thereto, thus producing a cosmetic basecoat.

The cosmetic basecoat according to Example 4 improved the spreadability of make-up cosmetics applied over the basecoat

and had effects in suppressing make-up running. In addition, after this product was stored for one month at 50°C, it was stable without any agglutination, separation, and increased viscosity.

Example 5: Highlighter

- |  |                    |
|--|--------------------|
| (1) Decamethylcyclopentasiloxane   | 95.0%              |
| (General formula (II), $n = 5$ )   |                    |
| (2) Organic silicone resin consisting of   |                    |
| $(\text{CH}_3)_3\text{SiO}_{1/2} / \text{SiO}_2 / (\text{CH}_3)_2\text{SiO} = 2.25/1.75/1.0$ |                    |
|  | 4.3                |
| (3) Titanium-mica type pearlescent pigment   | 0.5                |
| (4) Fragrance  | appropriate amount |

Components (1) and (2) were melted while heating. Components (3) and (4) were added thereto and were dispersed therein, thus producing a highlighter.

In addition, after this product was stored for one month at 50°C, it was stable without any agglutination, separation, and increased viscosity.

[Effects of the Invention]

The make-up cosmetics of the present invention have good water resistance, perspiration resistance, and oil resistance, and exhibit superior make-up durability with little make-up running, as well as superior stability. In addition, they exhibit good spreadability, and afford superior refreshing feeling in use.

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